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THE RECIPROCAL EFFECTS OF FEMALE LABOUR FORCE PARTICIPATION AND FERTILITY

by

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ABSTRACT

Data drawn from the 1975 U.S. National Fertility Survey are utilized to examine the causal interaction between female employment and fertility for a marital cohort. Reciprocal effects are hypothesized between these two important aspects of life for young couples. Analysis, based on both nonrecursive and dynamic structural equation models, is performed. Results from both types of models consistently show that, during the early years of marriage, fertility has a stronger impact on women's employment status than vice versa. However, the negative impact of fertility does not appear to last for a long period of time. It is also found that most of the effects of female employment on fertility act through the "opportunity costs" of having children. Reciprocal causation between fertiltiy and female employment is supported by the data.

Key words: **fertility, female labor force participation, reciprocal effects, LISREL analysis.**

Introduction

The inverse association between fertility and female labor force participation is well established in the developed countries. Early studies on the fertility-female employment relationship tended to use unidirectional models which treated either of the variables as the dependent, and the other as independent, variable. Those who maintained that the dominant causal path is from female employment to fertility (e.g. Blake, 1965, 1969; Havens, 1973; Kupinsky, 1971) contended that female worker roles have inherent qualities such as time constraints entailed by the employment, financial and socio-psychological rewards from the employment that tend to cause working women to have a lower fertility level than the nonworkers. On the other hand, those who contended that the dominant causal path is from fertility to work (e.g. Bowen and Finegan, 1969; Sweet, 1973; Mott, 1972; Shapino and Mott, 1979) argued that a large family size (particularly with young children) hindered women's participation in the labor force. In the past decade, investigators on this topic, having benefited from theoretical knowledge gained in earlier studies and the methodological sophistications enhanced largely by the advances in the computer technology, have started to examine the interrelationship between fertility and female labor force participation. Researchers have come to the realization that if mutual causation exists between these two variables, then the unidirectional models would be misspecified *a priori* and are likely to yield biased estimates of the true causal relationship. In order to examine the complex causal interaction between these two variables, simultaneous equation models are needed.

In studies which have attempted to estimate the reciprocal effects between fertility and female employment through the use of more complicated statistical models, two major types of models can be identified: nonrecursive and dynamic models. Nonrecursive models, usually based on cross-sectional data, specifically allow for simultaneous reciprocal causation between fertility and employment (e.g. Wait and Stolzenberg, 1976; Smith-Lovin and Tickamyer, 1978; Bagozzi and Van Loo, 1978, 1982; Cramer, 1980). Dynamic models , usually based on longitudinal data, examine the causal relationship between a woman's employment and fertility experiences according to the temporal

sequences in which they occur (e.g. Namboodiri, 1964; Hout, 1978; Cramer, 1980; Gurak and Kritz, 1982). The findings from a handful of published studies which use either nonrecursive or dynamic models to examine the fertility-employment interaction, however, are not conclusive.

Five previous published studies on fertility and employment which used cross-sectional nonrecursive models (Wait and Stolzenberg, 1976; Smith-Lovin and Tickamyer, 1978; Baggozzi and Van Loo, 1978, 1982; Cramer, 1980) have yielded somewhat contradictory findings. Wait and Stolzenberg (1976) conclude that while mutual causation is evident, labor force plans play a more important role in affecting fertility expectation than the reverse. Smith-Lovin and Tickamyer (1978) find a strong effect of fertility on years employed but only a very weak effect in the opposite direction. Cramer (1980) notes several plausible explanations for the seemingly contradictory results reported in these two studies. Firstly, the former examines the relationship between future expectation of fertility and employment status (measured by the intended total number of children and future plan for labor force participation), whereas the latter deals with the actual experiences of the women at the time of the survey (measured by children ever born and employment status at the time of the survey). Secondly, Cramer suspects that the contradictory findings may have resulted from the potential problems of multicollinearity which frequently plague nonrecursive models. As a consequence of the presence of multicollinearity or near multicollinearity, standard errors of the estimates tend to become very large and the estimated parameters become unreliable (inefficient). Hence, different estimates may be obtained with the same model in different samples. Thirdly, positive correlations were found between the disturbance terms of labor force participation and fertility in both studies. This suggests that common factors for both fertility and female employment may be omitted from the models. In other words, the models are likely to be misspecified. Finally, these two studies both use the two stage least square (2SLS) estimation procedures which yields inefficient estimates. Thus, discrepancies in the estimates are likely to occur simply as an artifact of the statistial procedures used.

Results from studies by Bagozzi and Van Loo (1978, 1982) and Cramer (1980), on the other hand have been used to argue that the fertility-employment relationship is a spurious one. They report that the association between fertility and employment disappears when simultaneous causal effects are allowed between them. Bagozzi and Van Loo report that both fertility and female labor force participation are caused by common tastes factors (ie. values of children, sex-role orientation and attitude toward wife's work) while Cramer's analysis suggests that both are determined by common socioeconomic variables and family size norms.

Cramer (1980) criticizes such nonrecursive models on both methodological and conceptual grounds. A major methodological drawback of nonrecursive models is multicollinearity, since such nonrecursive models are often underidentified. As a result of this problem, unreliable estimates are often obtained. Further, Cramer argues that the nonrecursive models are conceptually problematic because cross-sectional data at one point in time do not reflect properly the lagged effects that fertiity and employment have on each other. He maintains that longitudinal data are required to examine a proper specification of life cycle events in a dynamic model. While both criticism on nonrecursive models are valid, dynamic models have their own difficulties. Since longitudinal data which provide detailed history of women's employment and fertility behavior are scarce, application of the dynamic models is greatly restricted. In addition, the plausibility of establishing causal direction from panel data is questioned by some researchers (e.g. Davis, 1978; Heise, 1970). The major point they make is that in order to properly infer causal relationship between longitudinal data, one must know the time lag necessary for the effects to occur. The problem of course is that we rarely, if ever, have enough information about the detailed structure of a process to exactly specify the lag. Thus, to use panel design to discover causal direction requires information that, for all practical purposes, depends on knowing causal directions. The key issue therefore is to have a well-developed theory. Empirical results obtained from dynamic models do not provide a solid foundation for causal inferences either since arbitrary cut-off points are often used in these studies. Indeed, the evidence from these studies does not yield unequivocal results. While Cramer (1980) concludes, based on a dynamic model, that the dominant effects are from fertility to employment in the short run and from employment to

fertility in the long run, Gurak and Kritz (1982), also based on a dynamic model, observe no relationship between employment and fertility.

Both nonrecursive and dynamic models yield useful, although different, information. Researchers could make the best of what is available and attempt both strategies to enhance the knowledge of the relationship between fertility and female employment. A comparison of the findings from both nonrecursive and dynamic models shouold provide more reliable results and a more informed theory. Previous research is extended by using the full information maximum likelihood method which yields consistent and asymptotically unbiased parameter estimates. Sensitivity analysis is performed to evaluate the stability of the estimates in the presence of the multicollinearity problem in the nonrecursive models. Also, estimates of the model are adjusted for measurement errors. Previous studies, except Bagozzi and Van Loo (1978, 1982), have generally not allowed for the measurement errors in the model, although the consequences of measurement errors are well-known. [1] Incorporation of the measurement errors in the model appears to be particularly important when attitudinal variables are included, since they are usually measured more unreliably. Finally, analysis in this paper provides a comparison between information obtained from nonrecursive and dynamic models.

Theoretical Background

A number of different explanations have been suggested to account for the relationship between fertility and female employment. One major theoretical formulation is the role incompatibility hypothesis. This hypothesis views the inverse relationship between fertility and labor force participation as a result of the conflicts between the roles of mother and worker for those who jointly occupy these two roles (Stycos and Weller, 1967; Mason, 1981). As Terry (1975) points out, two types of role conflict may occur: normative incongruities and time incongruities. Normative

[1]Measurement errors, especially those of the independent variablels, tend to attenuate the effect parameters in the regression model (Lewis-Beck, 1980; Achen, 1982). In multiple regression models, the effects of measurement errors may accumulate and have very complicated effects on estimates. The consequences may either be attenuated or inflated estimates.

incompatibility occurs when a woman's participation in the labor force, particularly if she has young children, is "frowned upon" by the society unless there is economic necessity in the absence of a male breadwinner. Time conflict may result from the time allocation between child care and the employment. As a solution, women in the childbearing years are in a delemma of either restricting fertility to remain in the labor force, dropping out of the labor force for childbearing and childrearing, or somehow combining both roles. To measure role conflict and evaluate its effects upon fertility is nevertheless a difficult task. As a result, much of the evidence which attempt to show the impact of role conflict is highly speculative.

Many researchers have argued that the causal link between fertility and female employment has to be found at the individual, social psychological level. Scanzoni (1975) notes the theoretical significance of sex-role orientation. He maintains that role modernity preceeds and affects both employment and fertility. Those who prefer "individualistic" rewards and egalitarian role structures are more likely to seek employment outside the home and reduce the family size. Hypothetically, the more a woman pursues gratification through a nonfamilial occupational role the less she is likely to seek the latter. Bagozzi and Van Loo (1978, 1982, 1984) stress the role relationship between the husband and the wife. They argue that the greater the role egalitarianism between the spouses, the greater the extent of the wife's labor force participation and the smaller the family size. Results of several studies (Mason, 1974; Stolzenberg and Wait, 1977), however, found minimal importance of the sex-role orientation in determining a woman's fertility and employment experiences. Given the fact that attitudinal variables usually have relatively greater measurement errors, these results may be partly a consequence of the attenuated estimates for coefficients due to the failure of allowing measurement errors in these studies. Other researchers have stressed the importance of psychological factors (e.g. Fortney, 1972; Hoffman, 1960). The relationship of fertility and female employment may be viewed as a matter of trade-offs in terms of the psychological costs and benefits that can be obtained from working and childbearing. The psychological benefits of working include social interaction, material stimulation, self-definition, esteem, challenge and enjoying one's job. The costs may include the lack of time for oneself or one's family as well as interference with the needs of

children. Blake (1965) suggests that companionship, satisfaction, creativity or stimulation intrinsic or complementary to the work would reduce women's desire to have a large family. To the extent that employment is perceived to be a permissible alternative to motherhood and the socio-psychological rewards are seen to outweigh the rewards of childbearing, female employment will have a depressing effect on fertility.

Another major perspective is micro-economic theory. This perspective has its basis on the early works of Becker (1960) and Mincer (1963), in which children are viewed as consumer durables and parents are thought to maximize the utility function of children. This perspective assumes that women who have children will have to forego employment, at least for a period of time. The income foregone when a woman stops working is considered as an indirect cost of children, namely the "opportunity cost". Micro-economic theories explain the inverse relationship between fertility and female employment primarily in terms of the "opportunity costs". A woman who is considering having a child would presumably evaluate whether the costs involved in bearing a child are worth the market wage she would have to forego in order to have a child. It is suggested that the opportunity costs correlate positively with women's earnings and that fertility is an inverse function of the opportunity costs. Under similar conditions, the utility of children decreases along with a rise in the cost of childbearing and the opportunity costs for mothers (Becker and Tomes, 1976; Mincer, 1963; Turchi, 1975; Easterlin, 1973). It is, however, argued that the existence of a direct causal relationship from economic activity *per se* to fertility is most likely if the opportunity costs are high and any interruption of economic activity to have children would lower their expected life-time earnings. Wife's preference for children and work has a more important role in some later works (Easterlin, 1973; Bagozzi and Van Loo, 1978, 1982). A woman's "taste" for work represents the degree of her motivation for employment independent of the wage rate. The stronger the "taste" for work, the more likely a woman will opt for working and having a smaller family. With expanding opportunities for women to gain income, prestige and psychic gratifications outside the family, childbearing becomes an alternative which exacts a heavy price. A high opportunity cost may encourage a shift in preference for market over domestic activity and thus lead to lower fertility.

Synthesizing the socio-psychological and economic perspectives, Scanzoni (1975) relates the concept of sex-role orientation to the utility maximization model. Women are likely to seek nontraditional kinds of rewards when they perceive alternative rewards that seem equally or more attractive than a child and when a child is too costly (beyond solely monetary factors) relative to other potential benefits. This is likely to occur when sex-role norms prescribe potentially available rewards other than child bearing. To the extent that women perceive relative social and economic benefits from employment, they are more likely to enter the job market and limit the size of their families.

The role-incompatability, socio-psychological and micro-economic theories can be treated as complementary to one another. Each perspective places emphasis on different aspects of the employment-fertility relationship. Implicit in these theories is the assumption that fertility is the dependent variable in the relationship. In summary, the negative effects of female employment on fertility may be a combination of the following factors: (1) the practical dilemmas a woman faces in carrying out a double burden of competing and conflicting tasks and responsibility, (2) the changing attitudes of women whereby they begin to perceive employment as a legitimate alternative or complementary sources of satisfaction and identity to motherhood, and (3) the economic rewards from the work place which on the one hand increase the benefits of employment and on the other hand increase the price of children through the opportunity costs.

A number of studies have posited the reverse order of causation. That is, fertility determines labor force participation. Although the reasoning behind this causal order is not as well developed, the underlying rationale is that childbearing is the primary normative activity for young women and everything else is secondary to this task. Pressures from the normative timing of life course events mandate early adulthood as a period of family building. The vast majority of young women would intend to have children and carry out these intentions during the early years of marriage. Given the priority of traditional roles, extra familial activities may be arranged around them and possibly be dropped entirely to accomodate children's demands. Thus, according to this reasoning, the number

and age of children a woman has determine her employment status after marriage. Empirical evidence supporting this causal ordering has been presented by Felmlee (1984), Sweet (1973), Bowen and Finnegan (1969), Cain (1966) and Gendell (1965), among others.

Several researchers maintain, some provide evidence, that simultaneous reciprocal effects exist between fertility and employment (e.g. Cramer, 1980; Turchi, 1975, Willis, 1973). On the one hand, a large family size constrains women from participating in the labor force. On the other hand, a woman's employment outside of home reduces the number of children she has. The causal linkages go in both directions simultaneously. When faced with the actual problem of coordinating work and home life, a couple's decisions about wife's work and children influence each other.

Still others argue that the relationship between fertility and employment is spurious. Both decisions on working and having children are the results of the common antecedent factors. Mincer's hypothesizes that: "choices of labor and family size are not causally related to one another... but are simultaneously determined by the same basic economic variables" (1963:78). Bagozzi and Van Loo (1978, 1982) view the nature of the role relationship between husband and wife as a common determinant for fertility and employment. Terry (1975) contends that the couple's socioeconomic background determines both the wife's employment and fertility behavior.

Given the small number of studies and the inconsistent findings, the interrelationship between fertility and employment remains unclear. Are both female labor force participation and fertility determined by common antecedent variables? Is the causality unidirectional, and if so, in which direction? Or, do fertility and female labor force participation have reciprocal effects on each other? Among the four hypotheses on the causal direction between fertility and employment, the one which posits reciprocal effects between them appears to be most convincing. Since children, especially young children, make great demands in attention and responsibilities on parents, particularly on the mother, it is not surprising that fertility has at least a temporary negative effect on mother's employment status. On the other hand, as economic and psychological rewards from work place become increasingly available and attractive to women, it is also reasonable to expect women to prefer a

smaller family size. It appears to be most likely that decisions on both events influence each other simultaneously. This paper uses both nonrecursive and dynamic models to examine the reciprocal interaction between fertility and female employment.

Analytic framework and Hypotheses

All the major theoretical models reviewed above are formulated at the individual level. Since a well developed theory linking macro-models to these micro-models is lacking, the empirical test is performed at the individual level. Conceptual frameworks for an nonrecursive and a dynamic models are shown in Figures 1 and 2 respectively. These models incorporate social, social psychological and economic variables along with the background characteristics of the couple. Expected directions for the relationship among some of the variables are shown in the figures.

In the nonrecursive model (Figure 1), following the rationale suggested by Smith-Lovin and Tickamyer (1978), we express fertility and female employment as cumulative variables to better reflect the behavior patterns of the household at the time of the survey. The number of children ever born and duration of employment since marriage are hypothesized to have an inverse effect on each other. It is expected that the number of children ever born to a woman has a direct impact on the duration of her work after marriage while employment may influence fertility both through the opportunity costs and through other sociopsychological factors. These sociopsychological effects of employment on fertility are to be captured in the direct effect of employment duration on fertility (b_{33}). The economic and sociopsychological effects of employment on fertility are statistically differentiated.

Two normative variables, wife's ideal family size and sex role orientations with regard to female employment, are seen as antecedent variables for fertility and female employment behavior. By including these attitudinal variables, the theoretically important relationship between these predispositions and behaviors can be examined. Ideal family size reflects a woman's preference for family size while sex-role orientation with regard to employment reflects her perception of mothering

Figure 1 : Conceptual Framework for a Nonrecursive Model of the Relationship Between Female Employment and Fertility

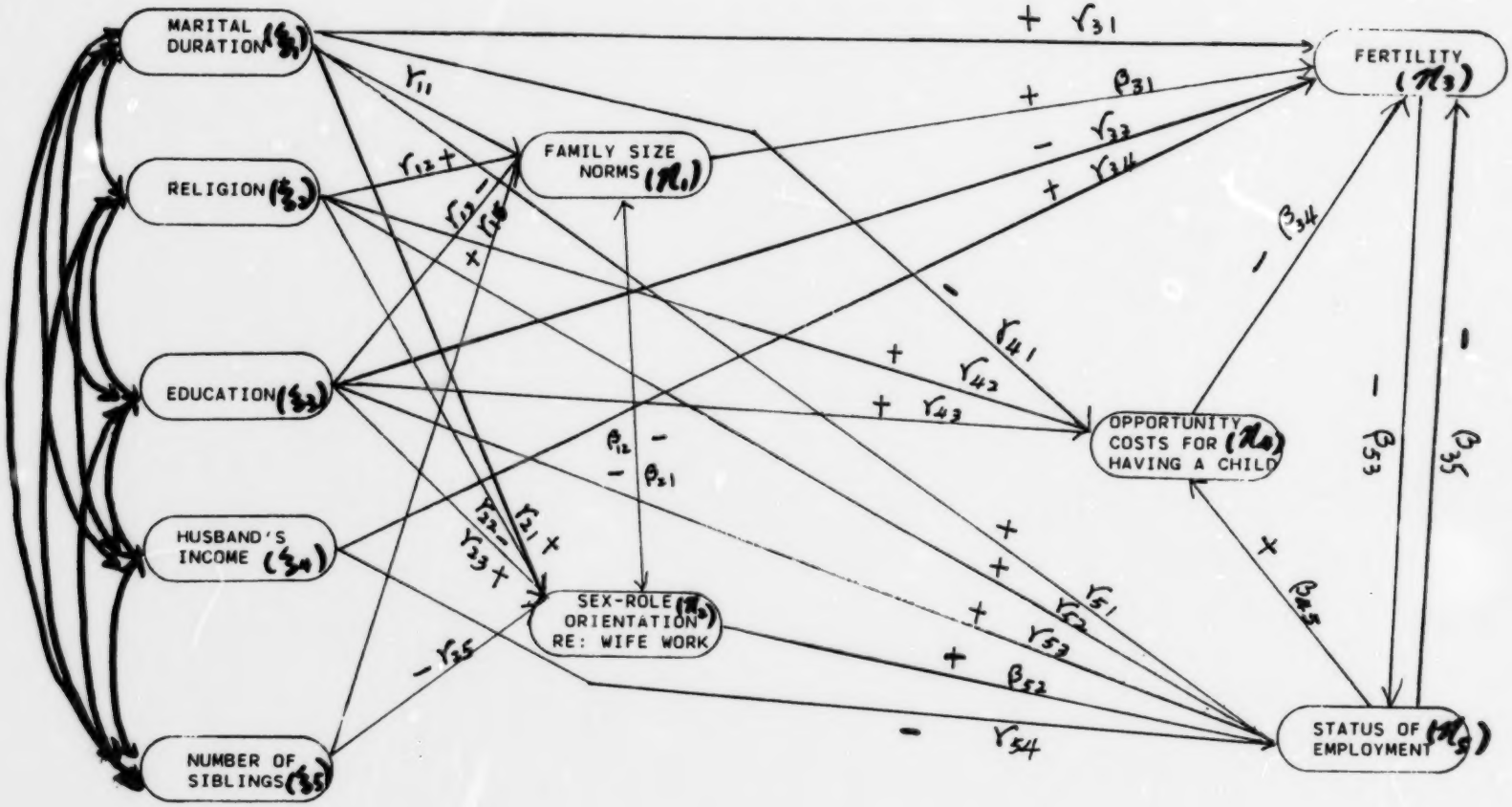
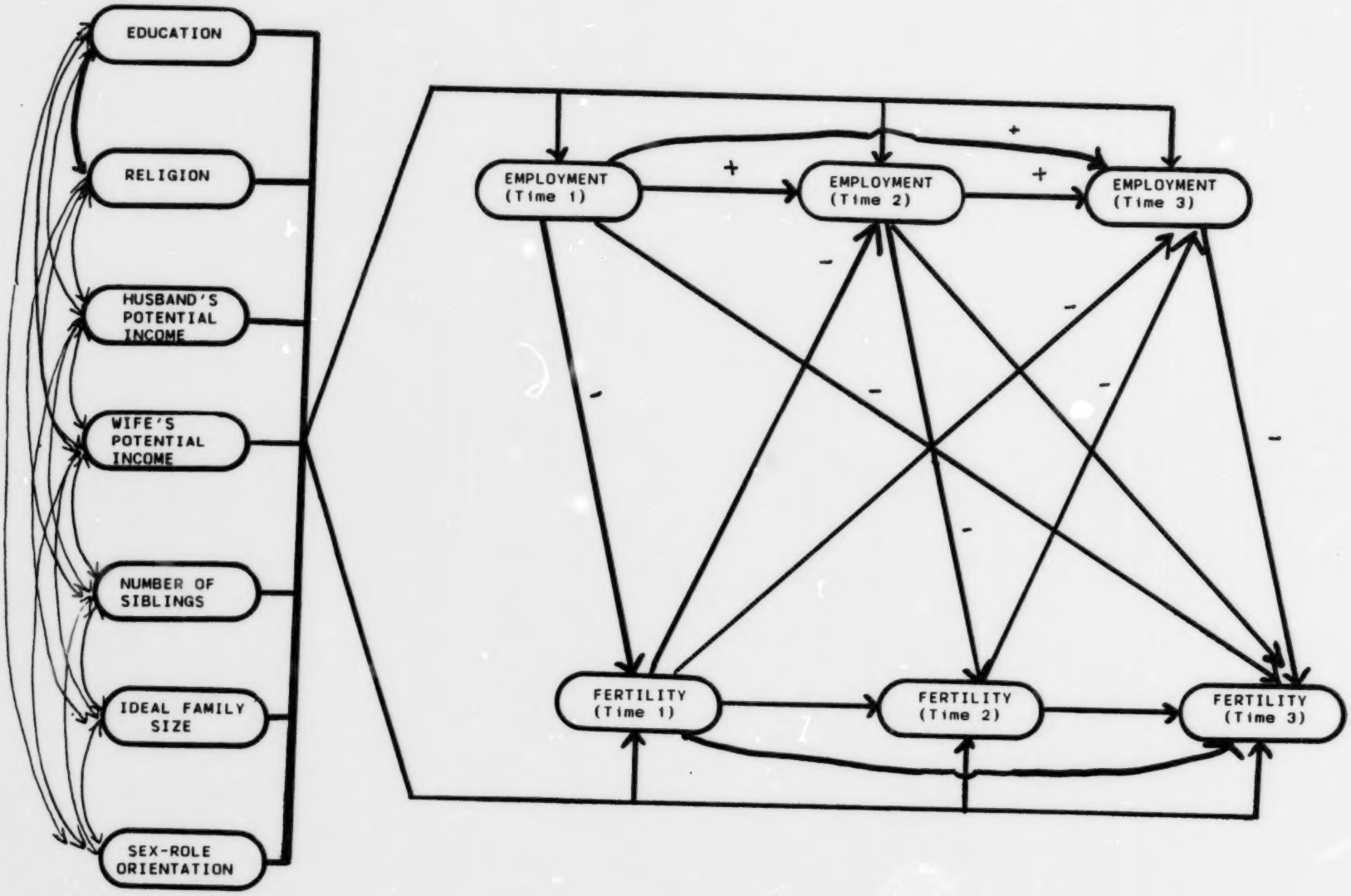


Figure 2 : Conceptual Framework For The Dynamic Model Of The Relationship Between Female Employment and Fertility



and career as a proper women's role. These two attitudinal variables are expected to influence each other. Women who favor a large family size are likely to have a more traditional view on extrafamilial work role and vise versa. These attitudinal variables are assumed to be formed in early life through socialization process and remain fairly stable at the early stage of marriage.

To establish an nonspurious relationship between fertility and female employment, various background characteristics of the couple are needed as control variables. These exogenous variables include marital duration, wife's religious affiliation and educational attainment, and husband's income. It is expected that marital duration, as a control for the extent of exposure to the "risk" of fertility and employment, has a positive impact on both. Catholics are expected to have a higher fertility due to a larger family size norm that Catholism prescribes. Catholic women are also expected to have a more traditional view of female employment after marriage and tend to spend a shorter period of time in the labor force after they are married. The effect of wife's education is relatively well-established. The better educated women tend to have a higher propensity for participating in the labor force and having a smaller family size. Husband's income is a measure of the family's general financial situation, independent of the income contributed by wife's employment. According to microeconomic perspectives, husband's financial well-being encourages fertility while wife's potential wage rate discourages it. Everything else being equal, the higher the husband's income the less likely the wife is employed. The number of siblings is expected to have an impact on both family size norms and sex-role orientation and have an indirect effect on fertility through family size norms. Those who come from a large family tend to value a large famaily size themselves and have a more traditional view on wife's role.

In the dynamic model, a woman's employment and fertility status are measured at various points in time. Employment status at an earlier time is expected to have a negative effect on the number of children born at a later time while the number of children born during an earlier period of time is expected to reduce the mother's length of employment at a later time. For this model to be identifiable, the socioeconomic characteristics and attitudinal variables are assumed to be stable and

are all treated as exogenous variables. They are expected to influence both fertility and employment behavior at different points in time.

Data and Measurement

Data used in this paper are drawn from the 1975 U.S. National Fertility Study, which was designed to examine marital fertility, contraceptive practice, the determinants of fertility and other related issues. It was based on data collected from a national probability sample of continuously married white women who were married before the age of 25 and had been married for less than 25 years. The actual field work was conducted during 1975 and 1976. Questions on wife's employment history in the reference period, Jan. 1970 to Dec. 1976, were asked. Information on duration of employment since marriage is available only for marriages that occurred after 1970. As a result, the analysis is restricted to those marriages which were contracted after 1970. To allow a period of time for interaction between female employment and fertility, the analysis for the nonrecursive model is further restricted to those who were married for more than a year. This yields a sample of a marital cohort which consists of white women in their intact first marriages that have a duration between 1 and 5 years (n=852). For the dynamic model, a smaller sample is used. Only those who were married in 1970 are included in the analysis since only this marital cohort provides sufficient information for this type of model (n=117). Interpretations of results in the dynamic model warrant some caution due to this relatively small sample size.

The indicators for the unobserved variables which are incorporated in the models are presented in Table 1. In the nonrecursive model, the cumulative measures of fertility and wife's employment status are the number of children ever born to a woman and the total number of months she had worked since marriage. In the dynamic model, employment status is measured during the following three periods: 1970-71, 1972-73 and 1974-75. The number of live births is measured at two points in time: 1971-72 and 1973-74. Fertility status beyond 1975 is approximated with the number of birth in 1975 plus the additional number of children intended by the couple to provide a measure for future fertility status.

Table 1.: Unobserved (Latent) and Observed Variables Incorporated In The LISREL Models

Unobserved Variables	Observed Variables
---- Variables Used Only in the Nonrecursive Model ----	
Employment Status since marriage	# Months worked since marriage
Fertility	Number of children ever born (in actual number)
---- Variables Used Only in the Dynamic Model ----	
Employment Status 70-71	# Months worked during 1970-71
Employment Status 72-73	# Months worked during 1972-73
Employment Status 74-75	# Months worked during 1974-75
Fertility Status 73-74	# live births during 1973-74
Fertility Status 71-72	# live births during 1971-72
Fertility in 1975 + Future Fertility Plan	# births in 1975 + additional # children intended
---- Variables Used in Both Models ----	
Marital Duration	Duration between the date of marriage and that of interview (in months)
Religion	0 = Non-Catholic 1 = Catholic
Wife's Education	years of schoolings
Husband's Income	Husband's potential income (in 17 categories) calculated based on husband's actual income, education and age
Number of siblings	number of live births respondent's mother had

(Table 1 continues)

Family size norms	Ideal family size 00 None 05 No more than 1 10 One 15 1 or 2, at leat 1 but no more than 2 20 Two 25 2 or 3, at leat 2 but no more than 3 30 Three 35 3 or 4, at leat 3 but no more than 4 40 Four 45 4 or 5, at leat 4 but no more than 5 50 Five 55 5 or 6, at leat 5 but no more than 6 60 Six 65 6 or 7, at leat 6 but no more than 7 70 Seven 75 7 or 8, at leat 7 but no more than 8 80 Eight 85 8 or 9, at leat 8 but no more than 9 90 Nine 95 9 or 10, at leat 9 but no more than 10 98 As many as God sends 97 Other answers 98 Don't Know 99 No Answer
Sex-role orientation with respect to wife's employment	The degree to which the respondent agrees to the statement that "It is much better for everyone involved if the mam is the achiever outside the home and the woman takes care of the home and family" (a 5-point scale where 1 denotes "strongly agree" and 5 denotes "strongly disagree")
Opportunity costs For Having a child	wife's potential income, calculated based on actual income, weeks worked and work limitation (disabled or handicapped =1) (in 17 categories)

Note: See Figures 3 & 4 for LISREL specifications of the measurement models (relationship between observed and unobserved variables).

The "opportunity costs" of having a child is measured by wife's potential earnings which were constructed by regressing the natural log of working women's reported earnings in 1974 on weeks worked , years of school completed and work limitation (disabled or handicapped =1). Expected log earnings were computed for all women. Husband's potential earnings were computed on the basis of a regression equation of actual income on occupation, education and age. The expected potential income is computed by using the regression coefficients derived from this equation. Sex-role orientation with regard to female employment is measured by the extent to which a woman agrees with the statement that: "It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and the family". It is a five-point scale where 1 denotes a traditional sex-role orientation and 5 denotes the opposite.

While the use of a marital cohort somewhat limits the generalizability of the findings, it increases the internal validity by partially controlling for history, maturation and life-cycle effects. Terry (1975) and Lindert (1978) show that the negative association between female employment and fertility tends to be stronger at the first stage of family formation than at later stages. Due to normative and biological reasons, most women have children at the early stage of marriage. Since preschool children make particularly great demands on mother's time and attention, role conflict between a mother and a worker is likely to be especially acute at the initial stage of marriage. Examining the interaction of female employment and fertility for marriages at this stage allows us to observe the relationship when the conflicts are likely to be most pronounced.

Methods

To estimate parameters and test hypotheses, the LISREL maximum likelihood procedures are used (Joreskog and Sorbom, 1985). This procedure analyzes systems of linear structural relations among variables. Measurement errors can be adjusted for in the model. Chi-square goodness-of-fit statistic is used to assess the adequacy of the model under consideration. Unlike two stage least square procedures, the present method yields efficient parameter estimates under the assumption of multinormality.

(% Error)
Error Variance

Figure 3 : LISREL Model For The Analytic Framework For The Relationship Between Female Employment and Fertility

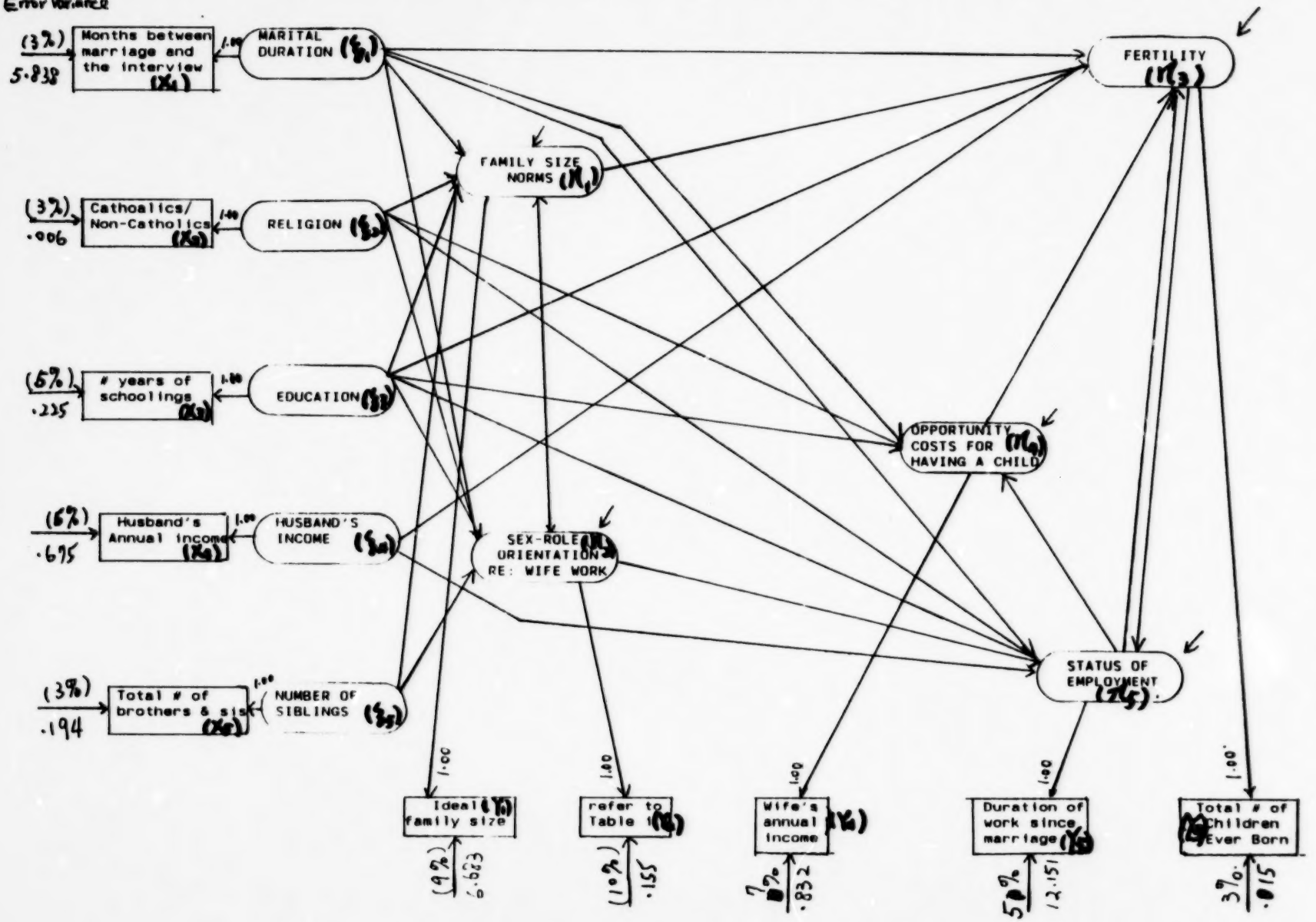
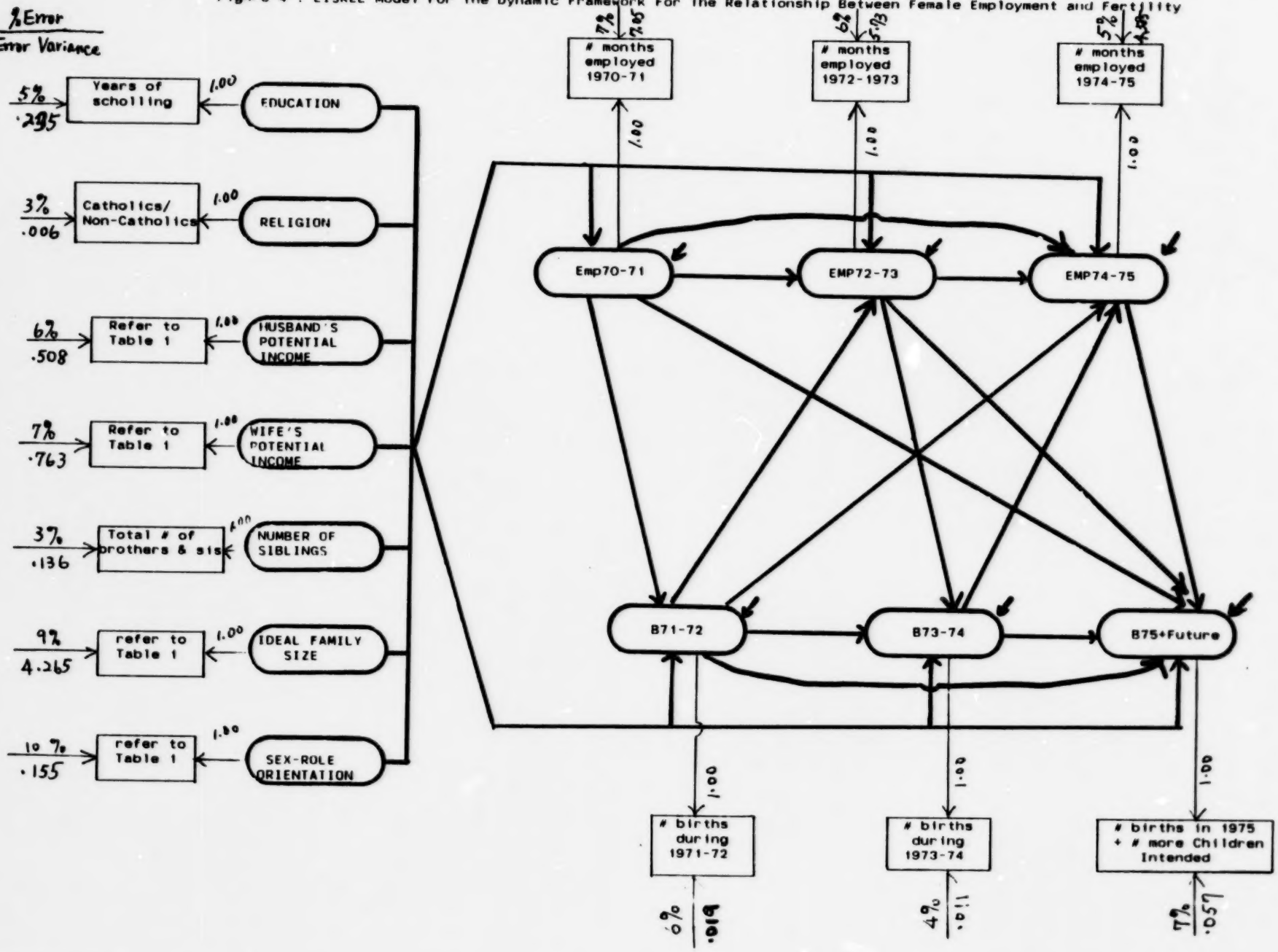


Figure 4 : LISREL Model For The Dynamic Framework For The Relationship Between Female Employment and Fertility



LISREL models which incorporate both observed and unobserved variables are shown in Figures 3 and 4. The amount of measurement errors adjusted for in the model is also shown in the figures. Since attitudinal variables are usually less well measured in terms of both reliability and validity, a relatively large amount of measurement errors is adjusted for in the two attitudinal variables. The indicators of the "opportunity costs" and husband's potential income are also allowed for greater amount of measurement errors because they are only approximations based on very crude measures.

Results

A. The Nonrecursive Model

The correlation matrix for the observed variables is shown in Table 2. Means and standard deviations of these variables are presented in Table 3. The mean marital duration for this sample was about three years (35.1 months). During that period, this cohort of women spent an average of 20 months in the labor force. The average number of children ever born was .6, reflecting that many couples remained childless at the time of the interview. The mean ideal number of children, however, was between two to three. About one-fifth of the women were Catholics. The average potential income for the wives, as expected, was much lower than that for the husbands.

When the maximum likelihood estimation procedure is applied to the nonrecursive model, it is found that this model is only arbitrarily identified. Serious multicollinearity problems are detected from the high correlations between several pairs of parameters (Table 4). In many instances, near perfect collinearity exists (see circled coefficients). Most of the arbitrarily identified parameters are related to b_{34}, b_{35}, b_{43} and b_{53}. It is clear that the program is unable to uniquely identify the relationship among fertility, duration of employment and the opportunity costs for having children as they are specified in this model. This lends some support to Cramer's suspicion that multicollinearity problems may plague the models in Smith-Lovin and Tickamyer (1978) and Wait and Stolzenberg (1976).

Table 2: Correlation Matrix For the Observed Variables Used in the Analytic Model

	MADUR	REL	REDU	HINC	SIB	IDEAL	ATT	CEB	WINC	WORK
MADUR	1.000									
REL	-.003	1.000								
REDU	-.039	-.056	1.000							
HINC	.221	.120	-.025	1.000						
SIB	.054	.170	-.291	.008	1.000					
IDEAL	-.064	.154	.040	-.024	.108	1.000				
ATT	.086	-.029	.330	.028	-.106	-.113	1.000			
CEB	.373	.054	-.329	.115	.168	.023	-.085	1.000		
WINC	-.083	.080	.345	-.018	-.134	.007	.182	-.491	1.000	
WORK	.417	.028	.251	.090	-.113	-.030	.185	-.300	.560	1.000

Table 3: Means, Standard Deviations For The Observed Variables

Variables	Mean	Std Dev
MADUR	35.102	13.943
REL	.264	.441
REDU	13.089	2.121
HINC	8.188	3.672
SIB	4.334	2.538
IDEAL	23.910	8.617
ATT	2.965	1.244
CEB	.649	.707
WINC	3.594	3.459
WORK	19.814	15.583

N of Cases = 833 (listwise deletion of the missing data)

Definition of the notations:

MADUR: Marital duration in months, REL: Religion,
REDU : Wife's years of schoolings,
HINC : Husband's income (in 17 categories),
SIB : Number of siblings,
IDEAL: Ideal family size (Refer to table 1),
ATT : sex-role orientation/attitude toward work,
CEB : Number of children ever born,
WINC : Wife's income (in 17 categories),
WORK : Total number of months worked since marriage

Table 4: Correlations of LISREL Estimates of The Model with Reciprocal Effects Between Fertility and Female Employment in USA, 1975

	BE 2 1	BE 3 1	BE 3 4	BE 3 5	BE 4 5	BE 5 2	BE 5 3	GA 1 1	GA 1 2
BE 2 1	1.000								
BE 3 1	-0.007	1.000							
BE 3 4	0.003	-0.352	1.000						
BE 3 5	-0.004	0.404	-0.911	1.000					
BE 4 5	0.003	-0.359	0.885	-0.901	1.000				
BE 5 2	0.001	-0.113	0.239	-0.271	0.242	1.000			
BE 5 3	0.004	-0.404	0.877	-0.993	0.893	0.272	1.000		
GA 1 1	-0.004	-0.004	-0.014	0.016	-0.014	-0.001	-0.016	1.000	
GA 1 2	0.002	-0.000	-0.002	0.002	-0.002	-0.000	-0.002	0.011	1.000
GA 1 3	-0.020	0.017	-0.005	0.006	-0.005	-0.000	-0.006	0.029	0.012
GA 1 5	-0.006	0.005	-0.000	0.001	-0.000	-0.000	-0.001	-0.044	-0.180
GA 2 1	0.081	-0.003	0.005	-0.006	0.005	-0.021	0.006	0.014	0.000
GA 2 3	-0.082	0.006	-0.011	0.014	-0.012	-0.012	-0.014	0.001	-0.000
GA 2 5	-0.145	0.002	-0.004	0.005	-0.004	-0.003	-0.005	-0.000	-0.000
GA 3 1	0.004	-0.391	0.909	-0.991	0.894	0.268	0.983	-0.017	-0.002
GA 3 3	0.004	-0.403	0.798	-0.948	0.830	0.260	0.952	-0.015	-0.002
GA 3 4	-0.001	0.067	-0.139	0.157	-0.139	-0.042	-0.156	0.002	0.000
GA 4 1	-0.003	0.287	-0.713	0.721	-0.806	-0.188	-0.713	0.013	0.001
GA 4 2	-0.001	0.055	-0.138	0.139	-0.156	-0.039	-0.138	0.002	0.003
GA 4 3	-0.003	0.210	-0.512	0.524	-0.586	-0.120	-0.520	0.009	0.001
GA 5 1	-0.004	0.394	-0.854	0.968	-0.869	-0.291	-0.975	0.015	0.002
GA 5 2	-0.002	0.147	-0.321	0.362	-0.327	-0.080	-0.365	0.006	0.000
GA 5 3	0.004	-0.389	0.844	-0.956	0.858	0.161	0.963	-0.015	-0.002
GA 5 4	-0.001	0.131	-0.284	0.322	-0.290	-0.088	-0.324	0.005	0.001

	GA 1 3	GA 1 5	GA 2 1	GA 2 3	GA 2 5	GA 3 1	GA 3 3	GA 3 4	GA 4 1
GA 1 3	1.000								
GA 1 5	0.296	1.000							
GA 2 1	-0.001	-0.001	1.000						
GA 2 3	0.016	0.005	0.023	1.000					
GA 2 5	0.007	0.015	-0.054	0.311	1.000				
GA 3 1	-0.006	-0.001	0.005	-0.013	-0.005	1.000			
GA 3 3	-0.008	-0.001	0.006	-0.015	-0.005	0.938	1.000		
GA 3 4	0.001	0.000	-0.001	0.002	0.001	-0.188	-0.147	1.000	
GA 4 1	0.004	0.000	-0.008	0.010	0.004	-0.714	-0.662	0.111	1.000
GA 4 2	0.001	0.000	-0.001	0.001	-0.000	-0.138	-0.128	0.021	0.126
GA 4 3	0.004	0.000	-0.008	0.007	0.004	-0.520	-0.479	0.081	0.515
GA 5 1	0.006	0.001	-0.006	0.013	0.005	-0.957	-0.928	0.150	0.685
GA 5 2	0.002	0.000	-0.003	0.005	0.001	-0.359	-0.347	0.053	0.261
GA 5 3	-0.006	-0.001	0.008	-0.013	-0.005	0.945	0.918	-0.150	-0.687
GA 5 4	0.002	0.000	-0.002	0.004	0.002	-0.319	-0.308	0.074	0.232

	GA 4 2	GA 4 3	GA 5 1	GA 5 2	GA 5 3	GA 5 4
GA 4 2	1.000					
GA 4 3	0.136	1.000				
GA 5 1	0.134	0.505	1.000			
GA 5 2	-0.010	0.188	0.363	1.000		
GA 5 3	-0.134	-0.515	-0.933	-0.338	1.000	
GA 5 4	0.045	0.169	0.263	-0.008	-0.309	1.000

Two frequently used solutions for multicollinearity problems are to increase the sample size so as to minimize the sampling errors of the estimates or to provide more information (e.g. other important variables) in the model in order for the model to become identifiable (Fox, 1984; Lewis-Beck, 1980). In our situation, neither approach is viable since the greatest possible sample size has already been used and there are no other relevant variables in the data set to be incorporated in the model. A third alternative, "sensitivity analysis" (Land and Felson, 1978), is thus used in this paper to explore the stability of the estimates for this arbrtrarily identified model. A sensitivity analysis can provide information on the extent to which estimates of the parameters obtained from an arbitrarily identified model vary according to certain particular identifying assumptions. In order to identify a model, various assumptions are made on the magnitude of certain parameters. Based on the range of values of the estimates obtained under different assumptions, one can gain some insight to the relationship among variables of interest. Although sensitivity analysis is not based on a rigorous statistical decision theory, it can best be viewed as an empirical procedure for exploring the implications of alternative identifying assumptions for parameter estimates. Details on various strategies of sensitivity analysis are presented elsewhere (Land and Felson, 1978; Kim, 1984).

To carry out sensitivity analysis in this paper, a series of assumptions are made on the magnitude of the direct effect of employment duration on fertility (b_{33}). A maximum parameter effect is chosen as a starting value for this parameter. This value is then gradually reduced to zero. Based on the degree of variations observed in the other estimated parameters in the model, we can note the "sensitivity" of the other parameters to the strength of the effects of female employment on fertility. The x^2 statistics provided by LISREL inform us the adequacy of alternative models with different assumptions about the magnitude of b_{33}.

The largest value chosen for b_{33}, which represents the impact of employment on fertility net of the opportuniity cost effects (i.e. through the practical time and physical constraint and sociopsychological rewards) is -.04. This coefficient indicates that every extra month of employment after marriage causes a woman to have .04 fewer child. To put the two variables on scales that are

more easily understandable, every extra year of employment reduces the family size by .5 of a child. Theoretically, one year's employment outside of home could have a maximum potential effect of reducing the family size by one child. To put it in another way, if a woman does not work for a year she may take the time to have an additional child. However, since a woman may not have a child during that year because of reasons other than extrafamilial employment such as financial instability or psychological or biological factors, the maximum negative effects of one year's employment (net of the opportunity cost effect) are taken as half of the possible potentials. This value is reduced gradually for each model estimation.

The results of the sensitivity analysis are presented in Table 5. Ten models are estimated with different assumptions on the magnitude of b_{33}. The table shows the x^2 values, significant level, the estimated values for b_{33} and its standard error for the ten models. The x^2 value decreases gradually from model 1 to model 5 and then stablizes. This indicates that the model fits progressively better. The values of b_{33} vary rather substantially among the models, ranging from 25.34 to -9.03. In the first model, where the magnitude of the effect of emloyment on fertility is assumed to be -.04, the value of b_{33} is large and positive (25.43). This value implies that if we assume every extra year of employment has the effect of reducing the family size by half a child, then every extra child a woman has will cause her to work 25 more months since marriage. This is such a high figure as to be very unlikely. In models 2 and 3, where b_{33} is assumed to be -.03 and -.02 respectively, the values of b_{33} decrease but remain positive. These results suggest that if the effect parameter of employment duration on fertility is greater than -.02, then fertility will have a fairly large positive impact on duration of employment. This positive effect of fertility on employment since marriage is not consistent with the major theories reviewed earlier or any previous empirical evidence in the developed countries. It is likely that these results are an artifact of the assumptions made on the effect of employment on fertility. The other indication of the inadequacy of model 1 to 3 is the large standard errors for b_{33} which suggest the unreliability of the estimates of b_{33}. As the value of b_{33} is set closer to zero, the standard error of of b_{33} becomes smaller and eventually stablizes, suggesting that the estimates are becoming more reliable.

Table 5: LISREL Estimates For a Series of Models Under Different Assumptions of The Effect of Employment on Fertility - b(3,5)

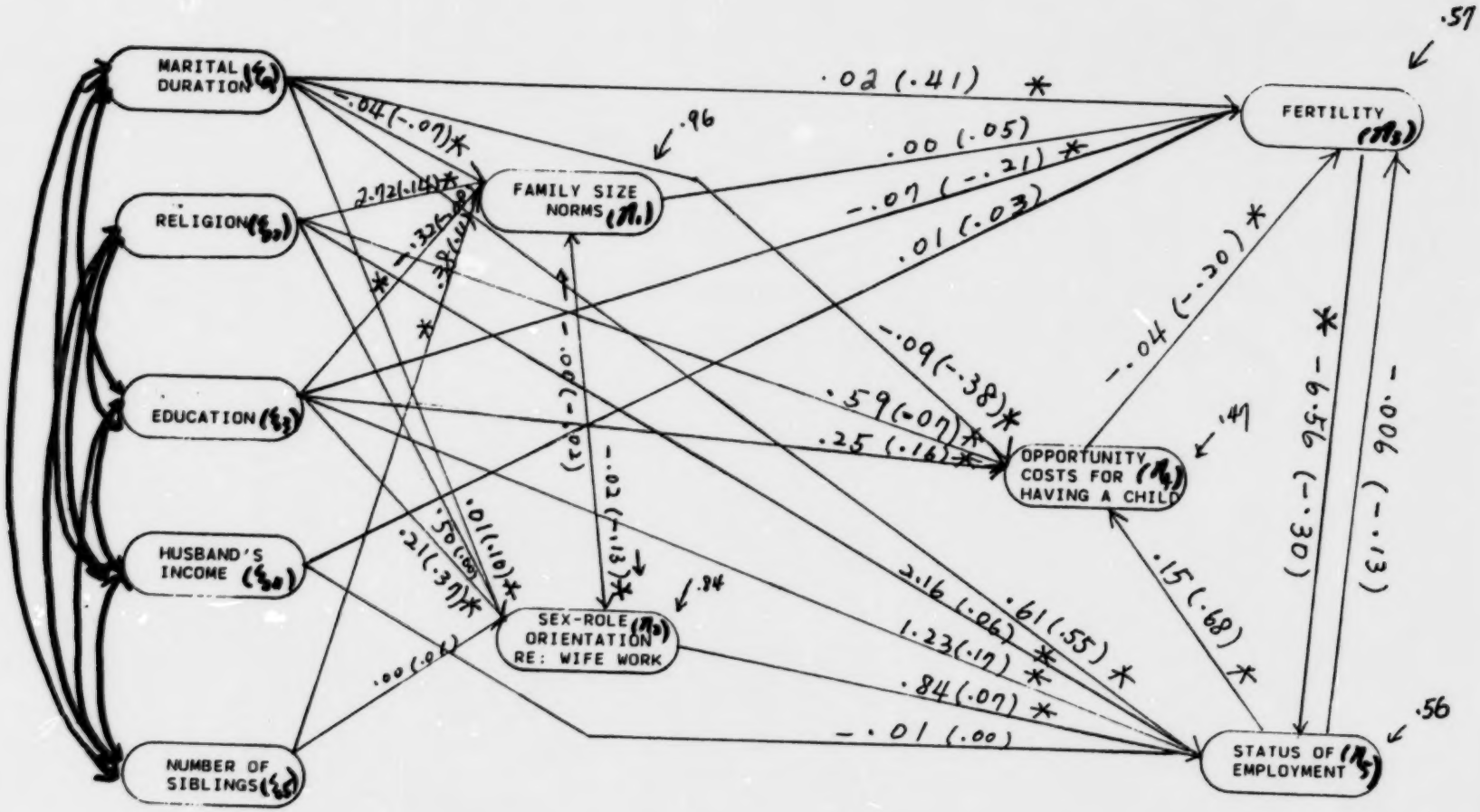
Model	Assumptions Emp → Fert (b3,5)	chi-square(p)	Fert → Emp b(5,3)	Std Error Of b(5,3)
1.	-.04	13.57(.41)	25.34	5.99
2.	-.03	9.58(.59)	9.60	2.47
3.	-.02	7.42(.76)	.89	1.44
4.	-.01	6.14(.86)	-4.87	1.04
5.	-.008	5.99(.87)	-5.81	1.00
6.	-.006	5.87(.88)	-6.67	.96
7	-.004	5.94(.87)	-7.50	.93
8	-.002	5.88(.88)	-8.28	.91
9.	-.001	5.86(.88)	-8.65	.90
10.	.000	5.85(.88)	-9.02	.89

From model 4 on, the value of b_{33} becomes increasingly negative. With the value of b_{33} assumed to be between -.01 and 0, an extra child could reduce a woman's length of employment by 6 to 9 months, as indicated by the estimates of b_{33}. These values appear to be fairly reasonable estimates since a woman is likely to take a leave from her work at least during the last few months of pregnancy and the first few months after a baby is born. Based on the patterns of fluctuation in x^2 and the standard error of b_{33}, we can see the model has started to reach a state of equilibrium from model 5 on. Therefore, the results from models 5 to 10 can probably be taken to be reasonable estimates for these data.

A fairly clear pattern of relationship between fertility and employment emerges from the above analysis. The number of children born to a woman has a large negative effect on the duration of employment (b_{33}). The direct effects of employment duration on fertiltiy are very small (b_{33}). The difference in goodness-of-fit between the model which assumes no direct effect (model 10) and those assume a small effect of employment on fertiltiy (models 5 to 9) is minimal. The effects of employment on fertility through the opportunity costs will be discussed later.

LISREL estimates for the model in which b_{33} is assumed to be -.006 (an arbitrary median value from the sensitivity analysis) are presented in Figure 5. The x^2 value indicates that this model fits the data very well. The difference between the covariances between the observed data and that implied by this model is not significant. Most of the parameters are in the hypothesized direction. The opportunity cost effect of having children captures most of the effects of employment on fertility. As expected, marital duration and respondent's education are the two most important determinants of both employment duration and fertility. Catholics favor a larger family size. Somewhat surprisingly, non-Catholic women have a more traditional view on wife's employment. Husband's income, however, does not have a statistically significant effect on either wife's duration of work or fertility behavior, although the relationship is in the expected direction. As hypothesized, controlling for wife's socioeconomic characteristics, the higher the husband's income the more children a couple have and the less the wife participates in the labor force. The insignificant effects may be an indication

Figure 5 : LISREL Estimates for the Framework of The Relationship Between Female Employment and Fertility in USA, 1975 with the Value of be(3,5) assumed to be -.006



d.f. = 11, χ^2 = 5.87 (.88)
Goodness Of Fit Index = 1.00
Total Coefficient of Determination
For Structural Equation Model = .73
* : Coefficient significant at .05 level

that the decisions of fertility and wife's employment are not directly related to a family's financial situations. Ideal family size does not have a significant impact on actual fertility behavior. Attitude toward female employment has a small but significant direct effect on the length of employment since marriage. Women who have a less traditional view of women's role tend to work longer than their counterparts.

The total effects of each variable on fertility and female employment are presented in table 6. The total effects of fertility on employment duration are greater than those in the opposite direction. Based on standardized coefficients, marital duration and respondent's education are the two most important determinants of the number of children ever born. For duration of employment, marital duration is still the best predictor while the number of children is the next important determinant. The proportions of variance in fertility and female employment explained by the variables in the model are fairly high (43% and 44% respectively). The total determination coefficients for the structural model, indicating the overall explanatory power of the structural model is also very high (.73). This information, along with the x^2 value, indicates that the proposed analytic framework is a reasonably good model.

B. The Dynamic Model

The correlation matrix for the observed variables incorporated in the dynamic model is presented in Table 7. It is interesting to note that the employment status during the three periods are positively correlated while fertility status during the three periods are negativley correlated. This indicates that the patterns of employment are fairly consistent over the years while the fertility levels during the three periods of time fluctuate, probably reflecting the spacing between children or couple's conscious choice of the timing for the family building process. In most cases, the fertility and employment status are negatively related.

Table 8 shows the means and standard deviations for these variables. The basic characteristics of this cohort are very similar to the larger sample used in the nonrecursive model. During the first

Table 6: Unstandardized (standardized) Total Effects of Other Variables on Fertility and Employment Duration When The Magnitude of The Direct Effect of Employment Duration on Fertility Is Assumed to be -.006

	ON FERTILITY	ON FEMALE EMPLOYMENT
MADUR	.02(.36)	.50(.45)
REL	.05(.03)	1.79(.05)
REDU	-.11(-.32)	2.12(.29)
HINC	.01(.03)	-.05(-.01)
SIB	.00(.01)	-.02(-.00)
IDEAL	.01(.05)	-.05(.00)
ATT	-.02(-.00)	.95(.07)
WINC	-.05(-.20)	.30(.00)
CEB	----	-7.13(-.30)
WORK	-.01(-.13)	----
R^2	.43	.44

Table 7: Correlation Matrix For the Observed Variables in The Dynamic Model

	REDU	REL	HINC	RINC	SIB	IDEAL	ATT3	EM701	B712	EM723	B734	EM745	B75F
REDU	1.000												
REL	-.026	1.000											
HINC	.198	.023	1.000										
RINC	.270	.028	.043	1.000									
SIB	-.246	.256	-.100	-.075	1.000								
IDEAL	.077	-.016	-.006	-.068	.028	1.000							
ATT3	.215	.047	.109	.302	-.041	-.095	1.000						
EM701	.213	.249	.186	.333	-.095	.015	.216	1.000					
B712	-.245	-.038	-.088	-.247	.191	.234	-.282	-.219	1.000				
EM723	.303	.100	.123	.558	-.203	-.113	.169	.534	-.433	1.000			
B734	-.175	-.036	.005	-.281	-.038	.197	-.142	-.214	-.084	-.260	1.000		
EM745	.119	-.025	-.038	.721	-.047	-.138	.165	.298	-.094	.627	-.418	1.000	
B75F	.385	.124	.086	.155	-.123	.233	.089	.241	-.341	.233	-.272	.031	1.000

Table 8 : Means and Standard Deviations For The Observed Variables Incorporated in the Dynamic Model

Variable	Mean	Std Dev
REDU	13.027	2.170
REL	.295	.458
HINC	9.866	2.909
WINC	2.527	3.302
SIB	4.402	2.129
IDEAL	24.107	6.884
ATT	2.848	1.246
EM701	12.116	10.032
B712	.518	.569
EM723	11.125	19.772
B734	.393	.526
EM745	9.786	9.576
B75F	1.009	.905

Listwise Deletion of Missing Data N of Cases = 112

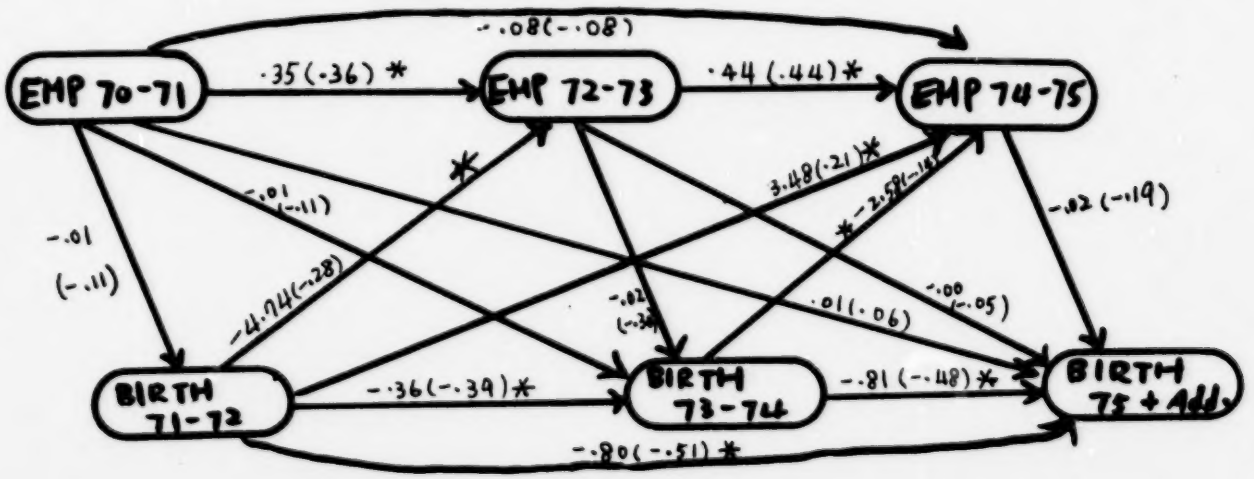
Definitions of the notations:
REDU : Wife's years of schoolings, REL: Religious affiliation (Catholic/non-Catholic),
HINC : Husband's income (in 17 categories), WINC : Wife's income (in 17 categories),
SIB : Number of siblings, IDEAL: Ideal family size,
ATT : sex-role orientation/attitude toward work,
EM701: Number of months employed between marriage and 1971
B712 : Number of live births during 1971 and 1972
EM723: Number of Months Employed during 1972 and 1973
B734 : Number of births during 1973-1974
EM745: Number of Months Employed during 1974 and 1975
B75F : Number of births in 1975 + additional number of births intended.

two years of marriage (1970-71), this cohort of women spent about half of the time (12 months) working. There appeared to be a decline in the length of time employed in the subsequent years. During the first three years of marriage, many couples remained childless. The ideal number of children for this sample was also two to three children. The mean number of children ever born at the time of the survey (1975-76) was 1.53 and the average number of additional children intended was .83 (not presented in Table 8 because these two variables are not included in the dynamic model). These values indicate that many of these women had not completed their childbearing activity at the time of the survey.

LISREL estimates for the dynamic model are presented in Table 9. The dynamic model fits the data very well (x^2 = 2.8, p=.83). A subdiagram for the model underneath the table may help the readers to better visualize the relationship between fertility and employment. In general, the number of children born in a certain period of time significantly reduces the number of months the mother works in the following period of time. The causal effects in the other direction, however, are not statistically significant. The number of months a mother is employed during a period of time has a negative but consistently insignificant impact on the number of children born during the subsequent period. To be more specific, the employment status in the first year of marriage does not have a significant effect on the number of births in the next two years (1971-72). In 1972-73, the employment status has a stronger, yet still insignificant, impact on the number of children born in 1973-74. On the other hand, the number of births during 1971 and 1972 has a significant negative effect on the length of employment during 1972 and 1973. A child born during that period reduces the length of the mother's employment in 1972-73 by about 5 months. An additional child during 1973-73 reduces the length of employment in 1974-75 by 2.6 months. This smaller effect during the second period of time may partly be explained by a possibly higher opportunity costs during this period, as reflected by the mother's earnings, due to the seniority and experiences she may have gained from the job over the years. It may also be a consequence of an increased financial responsibility entailed by the additional child. To meet a greater family expenditure, the mother may have to start working sooner than she could afford to during the first period of time. Hence, the negative effect of fertility

Table 9: Unstandardized and (Standardized) Coefficients On The Fertility and Employment Status During 1970 and 1975

	EMP 70-71	BIRTH 71-72	EMP 72-73	BIRTH 73-74	EMP 74-75	BIRTH 75 + Additional
EMP74-75						-.02(-.19)
BIRTH73-74					-2.58(-.14)*	-.81(-.48)*
EMP72-73				-.02(-.30)	.44(.44)*	-.00(-.05)
BIRTH71-72			-4.74(-.28)*	-.36(-.39)*	3.48(.21)*	-.80(-.51)*
EMP70-71		-.01(-.11)	.35(.36)*	-.01(-.11)	-.08(-.08)	.01(.06)
WEDU	.32(.07)	-.04(-.15)	.25(.06)	-.05(-.18)*	-.53(-.12)*	.08(.18)*
REL	6.00(.28)*	-.04(-.04)	.37(.02)	.01(.01)	-1.98(-.10)	.24(.13)
HINC	.49(.14)	.00(.00)	.03(.01)	.01(.06)	-.24(-.07)	.00(.01)
WINC	.85(.28)*	-.02(-.09)	1.25(.42)*	-.02(-.12)	1.63(.56)*	.02(.07)
SIB	-.54(-.12)	.04(.14)	-.38(-.08)	-.02(-.09)	.14(.03)	-.03(-.06)
IDEAL	.07(.05)	.02(.24)*	.00(.00)	.02(.27)*	-.10(-.07)	.06(.43)*
SEX-ROLE	.79(.10)	-.09(-.18)*	-1.15(-.14)*	-.05(-.12)	-.09(-.01)	-.09(-.12)
R^2	.26	.23	.60	.27	.76	.52



* significant at .05 level

may diminish.

Interestingly, the number of births in 1971-72 has a positive effect on employment in 1974-75. It appears that the negative effect of fertility does not last for more than two to three years. This may be reflecting the fact that a woman usually starts working again after her child(ren) grow(s) older. The pattern seems to be that those who start childbearing earlier tend to resume their work at an earlier stage. The slight and perhaps temporary decline in the amount of time employed in the third period may likely to be a result of the catching-up of childbearing in the previous period (1973-74), although data do not allow a direct examination of the "catching-up" hypothesis in this study. A similar pattern exists for the effects of employment on fertility. While the employment status in 1970-71 has a negative, though insignificant, effect on the fertility status in the next period (1973-74). It has a positive, though still insignificant, impact on the fertility status in the third period.

Fertility status beyond 1974 is influenced only by the number of births in the previous years and not by employment status at any period of time. Cramer's (1980) finding that employment status has a long term effect on fertility is not supported here. The fertility status at this stage is negatively related to that in the previous two periods of time. This, again, may reflect the tendency of catching-up for the couples who had postponed the childbearing in the earlier years.

The socioeconomic and attitudinal variables, in general, have a relatively smaller effect on fertility and employment status than the effects these two variables have on each other (see also the total effects presented in Table 10). They are nevertheless important variables in understanding the fertility-employment relationship. The opportunity costs have a strong positive effect on the length of time a woman is employed in all three periods of time and a negative impact on fertility. Husband's income, again, shows no significant impact on any of the fertility and employment variables. As expected, the better educated a woman is, the longer she is employed and the fewer number of children she has in the first few years. Education has a positive effect on fertility beyond 1974. Again, this may be a reflection of the tendency of postponing the family building process for women

Table 10: Unstandardized and (Standardized) Total Effects On The Fertility and Employment Status During 1970 and 1975

	EMP 70-71	BIRTH 71-72	EMP 72-73	BIRTH 73-74	EMP 74-75	BIRTH 75 + Additional
EMP74-75						-.02(-.19)
BIRTH73-74					-2.58(-.14)	-.77(-.45)
EMP72-73				-.02(-.30)	.48(.48)	.00(.05)
BIRTH71-72			-4.74(-.28)	-.28(-.30)	2.14(.11)	-.59(-.20)
EMP70-71		-.01(-.11)	.38(.39)	-.01(-.18)	.11(.08)	.01(.06)
WEDU	.32(.07)	-.04(-.16)	.56(.13)	-.04(-.16)	-.33(-.08)	.15(.35)
REL	6.00(.28)	-.08(-.07)	2.88(.14)	-.01(-.01)	-.99(-.05)	.32(.16)
HINC	.49(.14)	-.00(-.01)	.22(.06)	.01(.04)	-.18(-.05)	.00(.00)
WINC	.85(.28)	-.02(-.12)	1.65(.56)	-.04(-.24)	2.38(.81)	.02(.07)
SIB	-.54(-.12)	.04(.15)	-.76(-.17)	-.02(-.10)	.01(.00)	-.04(-.08)
IDEAL	.07(.05)	.02(.23)	-.07(-.05)	.02(.20)	-.10(-.07)	.03(.24)
SEX-ROLE	.79(.10)	-.09(-.18)	-.44(-.06)	-.01(-.03)	-.56(-.07)	.01(.01)

with higher education. Overall, the attitudinal variables do not have a strong impact, although they are more important determinants for fertility than for employment behavior.

Conclusions

Results from both nonrecursive and dynamic models do not support the hypothesis of "spurious relationship" since the association between fertility and female employment persists after the socioeconomic background and attitudinal variables are held constant. Our findings suggest that, for this marital cohort, marriage childbearing had stronger influence on work behavior than vice versa in the early years of marriage. The childbearing and childrearing role appeared to have taken precedence when these couples were faced with the actual problem of coordinating work and home life. Wife's employment status has, if at all, minimal effects on the number of children a couple have. A few possible explanations for this pattern are that normative pressure of having children in early adulthood persisted or that the couples had made conscious choice to concentrate childbearing activity in the early years so that the woman can enter the labor force without major interruptions in later years of marriage.

Comparison between the results gained from these two types of analysis gives an interesting and more informative picture of the relationship between wife's work and childbearing. An interesting finding from the nonrecursive model is that most of the impact of employment on fertility can be captured by the effects of opportunity costs. From the dynamic model, we see a more detailed but similar pattern of relationship between fertility and employment status at different points in time. A particularly noteworthy finding from the dynamic model is that fertiltiy and employment do not have a long-lasting effects on each other. The couples seemed to have a definite target number of children in mind. The duration of employment does not appear to have an impact on the fertility status in the subsequent period or the future plans of fertilty. Results in this study are by no means conclusive given the limited time frame studied in this paper. Further studies have to be done to examine if, in the long run, they are two independent family decisions. It is likely that as the supporting systems of childbearing and childrearing become better established in the developed countries, the burden of

family building on women's shoulders will be greatly reduced and eventually the decisions on fertility and wife's employment may become independent of each other. As mentioned, the restriction of analysis on a marital cohort limits the generalizability of the results. A complete understanding of the reciprocal interaction of women's work and fertility behavior requires analysis of other cohorts in different social contexts.

A dimension of the fertility-female employment relationship which is ignored in this paper is the impact of future expectation or plan on actual behavior. Clearly, people do behave based on a set of expectations. Incorporating the expectation elements in the analytic framework is therefore important and may yield more fruitful results.

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